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RETINOSCOPY.[1]

BY A. R. BAKER, M. D., CLEVELAND, OHIO.

It would be an interesting study to determine some of the causes which lead the medical profession to accept a new drug upon the most meager testimony when originating from the most obscure sources, while a new surgical procedure or instrument of precision in diagnosis is summarily rejected, and if ever brought into general use it is only after a long and persistent fight against the prejudices of the profession. This may be illustrated by the many long years which abdominal surgery took to gain the sanction of the medical profession, compared with the almost universal acceptance and use of cocaine as a local anæsthetic within a few weeks. Or even with jequirity, an agent quite as potent, and liable to very great harm when used improperly, which the merest tyro in medicine does not hesitate to emply and is used even by those who never dream of using the ophthalmoscope.

Although retinoscopy has been used very extensively by general practitioners and specialists in England and France, it has been almost entirely ignored by German and American practitioners. While Cuignet, Parent, Chibret, Forbes, Mor-

[1]Read before the Section of Ophthalmology of the Ninth International Congress

ton, Hartridge, Juler, Landolt and a host of others have written articles upon this subject extolling its value and urging its superiority and adoption over other methods of determining errors of refraction, no less an authority than Prof. Hirschberg of Berlin remarked, in a laughing manner, when the writer asked his opinion of the value of retinoscopy. "Oh, that is a *lazy English method*, and don't amount to much." Dr. Loring, in his excellent text book, says: "That it is, in his opinion, the most difficult and least satisfactory of any of the methods of determining the refraction of the eye, and contributes nothing which cannot be more easily and more expeditiously performed by the upright image."

It is unfortunate for any profession to permit national or race prejudice to bias the discussion of any scientific discovery, but the manner in which retinoscopy has been received shows that the medical profession have not risen entirely above these considerations. Retinoscopy was first brought to the notice of the profession by the French, and received by the English and used extensively by them. It was summarily rejected by the Germans and Americans without investigating its merits. It was a favorite theory of Bayard Taylor that the Americans were growing more like the Germans in their literary and scientific work and methods of thinking, if not in physical appearance. This has been particularly true of the medical profession in this country, who have, in a measure at least, seemingly followed the profession in Germany, accepting what the German professor accepts and rejecting what he rejects. He rejected retinoscopy, and true to the prevailing fashion the American rejected it without examining the subject for himself.

But this is not the only element which decided the question in the minds of such acute observers as Prof. Hirschberg and Dr. Loring.

Prof. Hirschberg (if he will pardon the personal allusion) is one of the most accurate men in the use of the ophthalmoscope I have ever met. I remember while in his clinic in Berlin, in 1882, of his examining a number of patients in the dark

room and sending them out for me to prove his ophthalmoscopic findings with trial lenses and test type. The accuracy of his ophthalmoscopic readings, especially in astigmatic cases, was a revelation to me, especially as I had always been rather skeptical as to the ability of anyone to determine accurately the amount of error in cases of astigmatism by means of the ophthalmoscope alone. But, granting that Prof. Hirschberg can determine the amount of error of refraction accurately by means of the upright image, it is not accomplished by everyone in fact very few, can do so.

The same remarks will apply to Dr. Loring to a certain extent, together with the fact that his name is associated with one of the best refraction ophthalmoscopes made. This method of determining refractive errors has become some what of a hobby with him, and he could not easily be persuaded that there was a better and easier method.

I believe one of the great objections to the introduction of retinoscopy has been the belief that the present methods are good enough. It has been the aim of nearly every oculist in this country and Germany to learn to determine errors of refraction by means of the upright image. Theoretically, this would seem to be the most rational method, but practically it has been found that few, if any, under forty years of age can practice it successfully, and that no one can do so unless he has a large amount of clinical material to keep him in constant practice. Another reason why retinoscopy has not been better received by the profession in America has been the unfortunate manner in which the subject has been presented to American readers.

The only articles which have been published in this country (Dr. Swan M. Burnett's work on Astigmatism has appeared since this was written) were that by Dr. Jackson, in the *American Journal of the Medical Sciences*, June, 1885, and a brief paper in the AMERICAN JOURNAL OF OPHTHALMOLOGY in July, 1884, by the writer. Dr. Jackson comm.ts the grave error of recommending a plane mirror, and instead of neutralizing the shadow, by means of lenses,

he judges of the amount of error by the distance he is obliged to go from the patient in order to neutralize the shadow. The method recommended by him is not retinoscopy as taught and practiced by the French and English, but merely a modification of the old method known as the "fundus image" test. It has always been recognized and utilized to a certain extent, that in emmetropia at a distance of several feet, when a light was directed into the eye from an ophthalmoscopic mirror, nothing but a red reflex could be distinguished. If the eye was myopic or hypermetropic in a high degree the disk and blood-vessels could be seen. When a plane mirror is used, these vessels will move in a direction against that of the mirror in myopia, and with it in hypermetropia, and by gradually approaching the patient the vessels will become invisible and as you come closer will be reversed. This point of reversal corresponds to the far point of vision, and by measuring the distance from the eye the amount of myopia or hypermetropia may be approximately determined. It is to be regretted that Dr. Jackson has presented this somewhat difficult and, at best, uncertain method of determining errors of refraction in place of the simple, uncomplicated and definite method of retinoscopy as taught in the English ophthalmic hospitals. I like the term retinoscopy, and believe it will be retained as the proper one. At one time I was greatly in favor of substituting the name of "Shadow Test," as I thought that would convey the proper meaning of the method of examination a little more definitely, and prevent the confounding of it with other mirror tests, as Dr. Jackson has done; but I see he uses as the title of his article the very term that I thought would prevent this mistake.

The examination by this method is so simple that I sometimes think much valuable time has been wasted in explaining the method of its performance. I fear that the descriptions have often served to render the subject more obscure. With a few trials I have been able to teach students with no special skill in the use of the ophthalmoscope to use it satisfactorily and with benefit to patients. I know one spectacle peddler

who, making no pretensions to a knowledge of refraction and accommodation, uses it successfully in his business.

In teaching the use of retinoscopy, if possible, I select for examination a person with emmetropic eyes—usually a fellow student. For beginners it is better to dilate the pupil with cocaine.

My ophthalmoscope is furnished with two mirrors attached by means of a screw; one large mirror of about twenty-four inches focus for making examinations by the indirect method and for performing retinoscopy; and one mirror (small) placed at an angle of the usual focus for direct examinations. This is known as Johnson's ophthalmoscope, and is made by Crouch, of London.

I seat the patient with his back to the light and the student opposite at the distance of about three to four feet. I then direct him to reflect the light into the eye of the patient, who is requested to look past the opposite ear of the one making the examination. If the observer has had a little experience in using the ophthalmoscope, he catches the red reflex from the fundus directly. With beginners, I find this the most difficult part to teach. I then direct the examiner to rotate his mirror from side to side slowly and watch the red reflex carefully, and ask him whether he sees a slight shadow moving across the red disk. Most observers see it easily, others require some little time. Beginners often make the mistake of moving their heads instead of rotating the mirror. I then direct them to rotate the mirror in the vertical meridian until they see the shadow again.

I am careful to see that they *rotate* it—not move it up and down. I then place an +1.D in a spectacle frame in front of the eye examined. The examiner will soon tell you he can see no shadow. I then put in a plus lens (having the + 1.D in place, which I do not change during the entire examination) and he again sees the shadow. I direct him to observe closely the direction in which it moves. I alternate plus with minus lenses, and the examiner will soon tell you that with the plus lenses the shadow moves opposite the direction in which the

mirror is moved and with the minus lenses it moves with the mirror.

By leaving the + 1.D in the frames, we are not obliged to make the additions and subtractions which are necessary if it is removed, and we go on with the examination just as if it were not there, making the calculations as simple as with a plane mirror.

One of the first questions asked by the student is why do we have this shadow moving in the same direction as the mirror in low degrees of myopia? And why it is necessary to use this +1.D to neutralize the shadow in emmetropia? This is because, with a mirror of twenty-four inches focal distance, the rays of light do not cross before reaching the observer, and an erect image of the illuminated and shaded portion of the retina is obtained the same as when a plane mirror is used.

The following rules [Morton, Refraction of the Eye, page 36] are of great practical importance in making these examinations:

1. "If the image of the shadow appear to move in the same direction in which the mirror is moved, and if the rapidity of movement and curvature of the shadow are the same in all meridians we have to do with a simple myopia.

2. If the shadow appear to move in the opposite direction to that in which the mirror is moved (remember in all of these examinetions the +1.D is to be left in situ) and if the rapidity of movement and curvature of the shadow are the same in all meridians, we have a simple hypermetropia.

3. The slower the movements of the image the feebler the illumination; and the more crescentric and narrower the shadow, the higher the hypermetropia or myopia.

4. A difference in two opposite meridians, either of the direction or rapidity of movement or of the curvature of the shadow, indicates astigmatism. These two dissimilar shadows moving at right angles with each other—either one vertically and the other horizontally, or both obliquely—indicates the meridian of greatest and least refraction.

5. If the shadow move with the mirror in one meridian and

against it in another, we have a case of mixed astigmatism."

By means of ordinary trial lenses it is easy to measure the amount of error of refraction. If the shadow move with the mirror, we place concave lenses in the spectacle frame until the shadow is neutralized, and the number of lens required will indicate the amount of myopia.

If the shadow moves opposite to the direction in which the mirror is moved, convex lenses are used until the shadow is neutralized, and the lens required to neutralize the shadow will indicate the amount of hypermetropia. In cases of simple astigmatism, no shadow will be seen in one meridian and a shadow moving with or against the mirror in the opposite. By neutralizing this shadow with the appropriate lens, it will indicate the number of the cylindrical glass required to correct the astigmatism. In cases of compound astigmatism it will be necessary first to correct the meridian with the least error of refraction. This will indicate the spherical lens required; and then by correcting the meridian with the greater error, and deducting the lesser from the greater, the cylindrical lens required will be found. Suppose we have a case in which it requires a +1.D to neutralize the shadow in the horizontal meridian and a + 3.D to neutralize it in the vertical. To correct this error would require a spherical 1.+D ⌒ + 2.D cylindrical axis 90 3.D—1.D.

Cases of myopic compound astigmatism may be corrected in a similar manner, using concave lenses. Cases of mixed astigmatism can be corrected in the same way. Supposing a given case requires a +2.D to neutralize the shadow in the vertical meridian, and a minus 1.D in the horizontal + 2.D—1.D, the following formula would indicate the lens required to correct the error of refraction; spherical +2.D ⌒ —1.D, cylinder axis 180.

I think one reason why the use of retinoscopy has not come into more general use is the fact that, in order to determine the amount of error of refraction, it is necessary to resort to the use of trial lenses.

One of the great objects to be attained by the numerous

optometers presented to the profession, and this has been almost as fruitful a field for the inventive genius of the oculists as the pessary has to the gynæcologist—has been to do away with the trial lenses. This has also been one of the great advantages claimed for the direct method of examination with the ophthalmoscope.

But whatever other means are made use of to determine the amount of error of refraction, I do not believe we will ever be able to discard the practical test with trial lenses. Often the lenses which are theoretically correct are not the ones practically best adapted to the needs of the patient. I presume my experience has been similar to that of most ophthalmologists, when I say that I frequently find patients wearing simple spherical lenses, selected either by themselves or some travelling spectacle peddler, who have discarded the use of compound lenses which have been fitted with great labor and skill by the oculist.

There is in all these cases an unknown quantity—the accommodation; and the ophthalmologist who keeps this fact in mind, and proves his readings either with the ophthalmoscope or by means of retinoscopy or anyone of the optometers by an actual test with trial lenses, will often save his reputation as an oculist, and render the best service to his patients.

But as it is often necessary to prescribe spectacles when we cannot have the aid of trial lenses, I have made use of the following simple device which occurred to me in an emergency some years since. As already stated, I make use of an ophthalmoscope with two mirrors attached by means of a screw. Simply by detaching these mirrors I have two instruments. First, a retinoscope with a good handle; and second, a series of lenses conveniently arranged for determining the amount of error of refraction, which answers every purpose of a trial case. This latter I give to the patient, directing him to look past my ear through the small hole. I then proceed to make the examination in the usual manner, directing him to turn up the proper lens as required.

I have made use of this simple procedure for a number o

years, and have found it to serve me admirably when away from my office, where I could not have access to trial lenses.

I have found the concave mirror much superior to the plane one. It concentrates the light so that we secure better illumination, and makes it possible to sit at such a distance from the patient that it is convenient to change the lenses without moving. It has been urged that the exercise necessary in walking backward and forward each time a lens has to be changed was of benefit to a physician of sedentary habits. This has not impressed me as of very great advantage. I would still prefer to have retinoscopy characterized as "a lazy English method" and keep my seat.

The advantages of retinoscopy are many. It does not require any expensive apparatus or paraphernalia. It is easy of execution; anyone capable of making an ophthalmoscopic examination can learn to use it in a few hours. It saves valuable time. Cases which formerly took from one to a dozen sittings as long as the patience of my patient and myself would permit, are now disposed of usually in one sitting of short duration.

Although it is necessary to use atropia occasionally to paralyze the accommodation, especially when there is spasm of the ciliary muscle, I find that since I have become accustomed to using retinoscopy it is not necessary to use atropia once where I formerly used it ten times. There is one point on which many observers are at fault; that is in directing the patient to look at the mirror. If instead the patient is directed to look past the ear of the observer at the dark wall beyond, the accommodation is relaxed, the pupil dilated and the examination made comparatively easy and the use of a mydriatic seldom necessary. With a little practice the physician soon learns to distinguish when the accommodation is relaxed by the condition of the pupil.

A retinoscopic examination is more easily performed than an ophthalmoscopic one by the indirect method. It is more accurate as a means of correcting errors of refraction than by the upright image, and the examination is made as quickly as with the optometer.

We are enabled to examine cases and correct the error of refraction without the assistance of the patient—a very important matter with children, ignorant people and those of feeble intellect. We are enabled by means of retinoscopy to fit spectacles accurately in cases of amblyopia as the result of the excessive use of tobacco, alcohol, etc., and especially as the result of squint. In cases of nystagmus, in which it is impossible to fix the eye, its use is invaluable.

I have purposely omitted all allusion to the optical principles involved, as they have been fully discussed in the many papers written on this subject. I have endeavored to present this subject in a plain, practical manner, and if this incomplete paper should be the means of creating enough interest in retinoscopy to lead you to give it a fair trial, I am sure you will be surprised with what ease difficult cases of error of refraction can be corrected.

INTERNATIONAL MEDICAL CONGRESS.[1]

SECTION OF OPHTHALMOLOGY.

DR. J. J. CHISOLM, OF BALTIMORE, MD., PRESIDENT.

Secretaries.—Drs. A. Alt, of St. Louis, Mo.; J. A. White, of Richmond, Va., and R. L. Randolph, of Baltimore, Md.

[CONCLUDED FROM PAGE 272.]

Dr. E. Landolt, of Paris, France, recognized three kinds of detachment. The first is due to choroidal exudation; the second, detachment in myopia; and the third, traumatic detachments. For the first, the treatment is perfect rest and compress dressing. He quoted a case which was cured and had remained well for three years. In the second class surgical interference may be justifiable, because there is scarcely any hope of restoration of vision in the part affected. He illustrated by a diagram his mode of operating with a Graefe knife, and remarked on the possibility of sucking out vitreous if the syringe was employed. For the third variety, traumatic detachments, there were no general rules. Some are restored with simple rest, and others resist all treatment.

Dr. E. Smith, of Detroit, Mich., had been struck with the remarks of Professor Abadie. In his first case he introduced an acupuncture needle, and the immediate result was brilliant; but the permanent improvement was *nil.* He preferred to do the operation suggested by Dr. Wolf, of Scotland, and would hope to get up adhesions to tie the retina down to the wound. Professor Galezowski's operation looks rational, if he does not puncture the retina.

Dr. Holcombe, of New York, remarked that Dr. Galezowski, when he spoke of a cure, did not mean complete restoration of vision, but only reduction of the detached portion, and its restoration to its original plane. He also described Sichel's operation.

Dr. Reynolds, of Louisville, wished to know whether it were a fact in the eye as in other organs, that frequent tapping is followed by increased accumulation.

Dr. Calhoun of Atlanta, Ga., wished to know what advantage is to be obtained by operating in cases of this kind of long standing. The eyes are blind, and vision is not restored, and the operation may set up inflammatory action. He had done sclerotomy many times, but without satisfaction.

Mr. Power, of London, Eng., found it difficult to understand how there could be restoration of vision in these cases of detachment. The pigment layer is detached from the retina and left behind, and does not reattach itself again as before. He believed there might be an apparent restoration where the detached portion had hung down over the good part like a bag, and after reduction of the detachment there was an apparent improvement in that part of the retina.

Dr. Behrmann, of Washington, D. C., wished to answer Dr. Calhoun's question by relating the course of a case that had come under his observation.

Dr. Galezowski remarked, in closing, that he had only done the operation in bad cases. If it had been done in all cases, we might get a better percentage of favorable results. An antiseptic might be injected into the cavity. It is possible for the retina to resume its function of vision, but even if it were not, the arrest of the process and saving the rest of the vision is of value.

Dr. J. A. S. Grant (Bey), of Cairo, Egypt, then read a paper contributed by Dr. Brugsch (Bey), of Cairo, who was not able to be present, on

The Predisposition to Glaucoma.

He said that increased tension, the recognized test-symptom of glaucoma, might be produced in two ways, either by increased secretion or by retention of the secretion, when normal in amount. He was inclined to think that the theory of retention was, at least in some cases, the one which appeared

reasonable. It was a question whether eyes with small corneæ were more liable to be affected, and he gave some statistics which seemed to point in that direction.

The predisposition of the Semitic race to glaucoma is remarkable. In other races it occurs in the proportion of one to one hundred, here the proportion is four to one hundred. He had been surprised by finding children affected with glaucoma. The cornea of the pure Egyptian is decidly smaller than that of other races, and he had been endeavoring to find whether the whole globe was also smaller, but his researches had been hindered by the trying climate, which produces decomposition in fresh eyes so rapidly. After iridectomy there appears to be a relaxation, and even an enlargement, of the corneal circle, as you can see if you notice that the coloboma will sometimes appreciably enlarge a considerable time after the operation.

Afternoon Session.

Dr. A. G. Sinclair, of Memphis, Tenn., reported

A Case of Retinal Glioma of Both Eyes.

A young child was brought to him with the history that some time before it was noticed not to see well, and soon appeared to be blind; then a white and somewhat lumpy appearance was observed in the pupil. Soon afterward black lines were noticed over the surface of this appearance, the retinal vessels. On examining the eye Dr. Sinclair found congestion of the conjunctival and episcleral vessels, pupil slightly dilated, tension somewhat above normal. The same appearance was observed in both eyes, except that the left cornea appeared somewhat abraded in the centre. Enucleation was proposed and was consented to. The right eye was removed together with about one-half inch of the optic nerve, and the left eye and the whole contents of the orbit, as far as possible, without cauterization.

A careful and complete pathological examination of the right eye was made by Dr. T. Mitchell Prudden, Director of

the Phsiological and Pathological Laboratory of the College of Physicians of New York, who reported it as a *glio-sarcoma.*

The left eye and its appendages were examined by Dr. Carl Heitzmann, of New York, and his report came to the same conclusion. These two examinations and reports were each made without any knowledge of the other.

The case has now been observed for six years since the operation, and there appear to be no signs of the return of the disease, and the child is perfectly healthy. No heredity was discovered.

Dr. Keyser, of Philadelphia, remarked that in cases of this sort he was doubtful if the child would live more than eighteen months or two years. One case of his had lived seven years, and one died eighteen months after operation of glioma of the brain. He was doubtful if the successes were cases of true glioma.

Mr. Power, of London, Eng., expressed the same doubt, although he has had some successes also.

Dr. Galezowski, of Paris, has operated for the removal of this disease, and one recovered and was afterward healthy. He had only seen four cases.

Dr. D. S. Reynolds said that he thought it is a malignant proliferation conveyed through the lymph-channels. When it originates in the retina he saw no reason for its not being successful. He had had a case where he had enucleated both eyes, which were invaded simultaneously and equally. There was immunity for ten years.

Apropos of Dr. Reynold's remarks as to the origin of glioma, whether in the optic nerve or retina, Dr. R. L. Randolph, of Baltimore, M. D., remarked that in a microscopic examination of a gliomatous eye very recently, he found the optic nerve-fibres pressed apart by the growth, which latter extended up to the severed end of the nerve. The whole optic nerve tissue was disorganized and, so to speak, monopolized by the growth. He inferred that the growth must have had its origin in the optic nerve.

Dr. H. C. Paddock, of New York City, read the next paper, entitled,

Ergot of Rye in Ophthalmic Practice.

No mention is made of this remedy in the earliest works on medicine, and even until very lately it has been considered to be a medicine for the obstetrician alone, and only to be good to stimulate contraction in the uterine muscle. The action of ergot is to promote contraction of the blood-vessels, as well in other organs and tissues as in the uterus, and especially in the blood-vessels of the eye. Soelberg Wells in his work mentions it as a valuable remedy in congestions, episcleritis, etc., while Hammond says it possesses the property of contracting unstriped muscular fibre. It is certain that it does diminish the calibre of the vessels, and has a good effect in obstinate affections. It is a rational remedy, and nothing more is claimed for it than its general therapeutic properties. He gave a few cases in which it had seemed to exert a marked beneficial effect.

In the case of a woman with conjunctival congestion and pain and discomfort, the whole trouble was stopped on the third day. In still another case, Mrs. B——, twenty-five years of age, there was conjunctivitis, iritis, retinitis, and ciliary neuralgia. Under ordinary treatment she improved for four or five weeks and then came to a standstill. She was then given ergot, and was discharged cured in a few weeks. In regard to the use of ergot, he begged to remark that it is a reliable drug, that it must be used in maximum doses and for several days, and that it is a good tonic; that atropia should be used in iritis, and rely on general treatment for any complication that may arise.

Mr. Power, of London, England, then read a paper written by Mr. P. H. Mules, of Manchester, England, who was unavoidably absent, entitled

Evisceration and the Artificial Vitreous.

The object of the paper was stated to be to lay before the section the results of an operation which was intended to pro-

duce an improved appearance over the result in evisceration alone, with a clean cavity free from muco-pus. The mode of shrinkage after evisceration was discussed, and a blackboard demonstration of the method of operation given. The incision is made through the conjunctiva around the cornea, elliptical with its long axis horizontal. The conjunctiva is dissected back for a short distance, and an elliptical incision made throgh the sclera of about the same size and in the same position as that in the conjunctiva. The contents of the globe are then carefully cleared out, which is easily determined by the view of the white sclerotic in the interior of the eye. The glass ball is then introduced, the edges of the sceral wound carefully fitted together over the ball, care being taken to have no tension at the point of union, united by sutures, and the conjunctiva then brought together and sutured. There may be considerable reaction and some pain, which is treated in the usual manner. Mr. Power had done the operation about a dozen times, and had three bad results. One suppurated, and in two the wound yielded and the glass globe was pushed out. Catgut sutures are used.

Mr. Cross, of Bristol, England, thought Mr. Mules' operation would be a permanent one. The shield over such a globe has a better motion than any artificial eye on a natural stump can have, because the muscles have been placed in a position more nearly corresponding to that in the natural eye. It does not make any difference whether you use a glass globe or a silver, or, as has been lately recommended, a celluloid one. An advantage of this operation is that the lower lid is preserved, and is not gradually obliterated so that the shell cannot be retained. It cannot be said that Mules' operation will prevent sympathetic ophthalmia, because we cannot entirely clean out the globe. There may be affection of the lymphatics exterior to the globe already before evisceration, and it is, of course, impossible to reach them in this operation. Mules' operation is not to be compared with enucleation in sympathetic ophthalmia. We operate in sympathetic ophthalmia to save the other eye. It is not a question of appearance, but of sight.

Dr. Galezowski, of Paris, would divide the question into two parts—evisceration, and introduction of the glass ball. He saw evisceration first 14 years ago, with Professor Richet, in Paris. Great inflammation resulted, and it was not possible to introduce the glass ball. Enucleation was done six months after and the patient got well. He saw another case four months ago. Six months previous a good operation had been done, but a sinus had formed in the region of the wound. Treatment with antiphlogistics, antiseptics, etc., was of no avail. Enucleation was done and all was well. One year is not long enough for a final conclusion in the matter of result. In sympathetic ophthalmia there must be danger if we leave the smallest piece in the eye, and the enucleation must be completely and carefully performed, so as to leave none of the slerotic attached to the nerve.

Dr. Baker, of Cleveland, O., as an illustration of the ability to retain a foreign body in the eyeball with impunity, related a case which had occurred to him. A man had his eye burned severely with sulphuric acid, so that an unsightly ball was left, with no cornea. He put in a glass button like a collar-button, and the man had been wearing it comfortably ever since.

Dr. Keyser, of Philadelphia, Pa., stated that he would try Dr. Mules' method. He had had very severe inflammation occur after evisceration. To illustrate the danger of sympathetic ophthalmia, when enucleation is not effectually performed, he related a case where a small button of sclerotic was left on the divided nerve. He advised to get it all out, but it was not thought worth while, and sympathetic ophthalmia set it. He believed is was better to do evisceration early.

Dr. Dibble, of St. Louis, had seen two cases of bony deposit inside the sclerotic, and believed that in such a case the pressure of the glass ball would produce irritation and perhaps sympathetic trouble.

Dr. E. Smith, of Detroit, had seen Dr. Power do one of these operations, and although Dr. Power had predicted considerable chemosis and severe reaction, there was no trouble whatever, and a happy healing resulted. There was not even a bad

symptom. He laid stress upon the fact that the edges of the cut sclerotic should just meet, not overlap or strain.

Dr. R. L. Randolph, of Baltimore, Md., read a paper contributed by Dr. H. Gifford, of Omaha, Neb., entitled

Further Contributions to Sympathetic Ophthalmia.

It related to the posterior lymph-stream, and detailed the results of experiments with injections of India-ink and anthrax. The course of the injections was ascertained by examining the eyes at periods after injection, and it was found that, even in neurectomized eyes, the coloring matters or anthrax bacilli had reached the brain from the posterior chamber; even where the cerebral end of the cut nerve contained none, showing that there is a current from the posterior part of the eye back to the brain, independent of the channels of the optic nerves.

Mr. J. Richardson Cross, of Bristol, England, next contributed a paper entitled

Retinoscopy; It Promises a Rapid and Reliable Method of Estimating Errors of Refraction, and is a Test of the Greatest Practical Value.

He stated that the full correction of the refractive error is not the one that is always most likely to be accepted by the patient, when determined by the upright or direct image method. With trial glasses it is often necessary to use atropine, but in retinoscopy he has only found it necessary to use atropine in cases of spasm of accommodation. In all other cases cocaine is quite sufficient. Either the plane or the concave mirror may be used. The production of the image at the far point of the eye in myopia is the important unit in the question of retinoscopy. The shadow observed in myopia is that of the aerial image projected from the observed eye. With illumination, no movement, and no shadow, the observer must be near the conjugate focus of the rays. It is a usual thing to have one constant point to calculate from and work from, and

the usual standard of a little over a metre is objectionable, because it is necessary to get up and approach the patient to make every change of glasses. Dr. Cross could use an optometer made by Doyne, which he exhibited, at a distance of eighty centimetres, which obviated the necessity of moving with each change of the patient's glass. Mr. Cooper has brought out a somewhat more complicated optometer, by which you are enabled to sit at the full distance and turn the disk.

The proper point to estimate the refraction in the patient's eye is the macula, but it is not easy; the disk is easier, but not so accurate on account of the frequent occurrence of the physiological cup. The writer preferred to take a point midway between the two, which could easily be done by making the patient look at the other side of the face.

The results of retinoscopy are quite satisfactory; unsatisfactory in only about ten per cent.

The differences between the result with and without atropia are slight in degree, in a spherical direction, and do not exist to the cylindrical correction. A much higher degree of latent hypermetropia is discovered by retinoscopy than by trial lenses.

Drs. Keyser and Reynolds rose to questions of information as to the abolition of the accommodation in the use of the method, and

Dr. Galezowski stated that he liked the method, but did not like the name. He believed the shadow to be produced by the changes in the cornea, and that the proper name is keratoscopy. An advantage is that you can make a diagnosis of the refraction without atropine.

Dr. Galezowski's assistant, Dr. Parent, had described it very accurately, and used the name keratoscopy. In proof of its being the shadow in the cornea, the best diagnosis of staphyloma of the cornea could be made by this method. There is no reason at all for the term pupilloscopy.

Dr. A. R. Baker, of Cleveland, O., also read a paper on

Retinoscopy.

Although retinoscopy has been extensively employed by gen-

eral practitioners and specialists in England and France, it has been almost entirely ignored by German and American practitioners. While many competent observers have written extolling the method, no less an authority than Professor Hirschberg, of Berlin, remarked in a laughing manner, when the writer asked his opinion of the value of retinoscopy, "Oh, that is a lazy English method, and don't amount to much." And Dr. Loring, in his excellent work, thinks that it does "nothing which cannot be more easily and more expeditiously performed by the upright image."

Probably one reason for rejection of this method by Professor Hirschberg and Dr. Loring is their extreme accuracy in the use of the ophthalmoscope. But this accuracy was, he believed, limited to only a very few, and it required a large amount of clinical material to continue proficient, and few, if any, master the ophthalmoscope sufficiently under forty years of age to become proficient.

In teaching the method it is better to select an emmetropic eye for the first, and dilate the pupil. A concave is more convenient than a plane mirror. If the plane mirror is used, it is to be remembered that the image will move against the mirror in myopia and with it in hypermetropia, and the reverse with a concave mirror.

Dr. Burnett, of Washington, D. C., proposed the name scioscopy. He prefers the plane mirror.

Dr. Calhoun, of Atlanta, wished to know if all cases were corrected by this method so that they did not come back dissatisfied.

Mr. Cross, in closing, stated that retinoscopy was a name in general use now, and therefore it was better not to change it. He thought he would continue to use it. It certainly was not dependent on the view of the cornea, and he certainly never should call it keratoscopy.

FRIDAY, SEPTEMBER 9TH—FIFTH DAY—MORNING SESSION.

The Section being called to order, Mr. H. Power presented a new pattern of *ophthalmoscope, folding handle*, for vest-pocket

use, which could be carrid in a case much like a pair of eye-glasses. A paper was also mentioned as having been sent by Dr. David Prince, of Jacksonville, Ill., *On some Points in the Treatment of Dacryocystitis and Affections of the Nasal Duct*, with a new cannula for drainage, which instrument was exhibited to the Section. Dr. E. Smith, of Detroit, Mich., then read a paper on

The Treatment of Abscesses and Ulcerations of the Cornea with Jequirity.

He remarked upon the experience, common to all, of the difficulty in procuring the absorption of pus in the cornea, and noted the existence of the same tendency in all closed abscesses. The best means of arresting suppuration and of getting rid of the pus when formed has engaged the attention of the writer, with many others, for years. A paper on the above subject, in the spring of 1883, with another published in October, 1883, gave the result of his observations up to that time. He had since had many cases of ulceration of the cornea speedily relieved, and an astonishing clearing up of the cornea after its use. He believes the remedy affects the proliferation in corneal corpuscles. After explaining his impression of the mode of action of the remedy, he proceeded to describe his manner of using it. He does not use a strong preparation, and aims not to produce a sharp inflammation, as is done in trachoma. He uses a three per cent. solution, or a very minute quantity of the powdered seed. It is applied sparingly, till a mild catarrhal inflammation is set up, characteristic of the remedy, and in some cases there may be a slight membrane. The object is to avoid a high degree of reaction. The eye is kept washed out with a two per cent. solution of boric acid, and the result is almost uniformly surprisingly good. The corneal cicatrix is often hardly apparent to anyone but the patient.

Dr. Galezowski, of Paris, France, did not like jequirity. In his observation it had frequently produced ulceration and de-

struction of the cornea and synechia anterior, and in some cases enucleation had to be made to avoid sympathetic trouble. He thought jequirity exerted a very bad action on the cornea. The modification in Dr. Smith's method is doubtless in the amount of the drug used. Dr. Galezowski thought it a dangerous method.

In intermittent fever he had found ulceration of the cornea, which yielded to the administration of quinine. In another case, lasting for several months, after the extraction of a tooth, cicatrization occurred. The best treatment for corneal abscess and ulcer is the antiseptic method. He applies the powdered iodoform directly to the surface three times a day under cocaine, and uses the steam douche two or three times a day, ten minutes at a time. When it is not doing well cauterization with a solution of nitrate of silver, twenty-five centigrammes to ten grammes, may be done one or two times every day.

Dr. Richey, of Washington, D. C., wished to know whether scraping the ulcer before applying the remedy had not been found of advantage.

Dr. Smith said that Dr. Galezowski had probably used jequirity in trachoma, in the way described by DeWecker, till he obtained marked diphtheritic membrane. In these cases it was the swelling and chemosis that caused strangulation and loss of cornea. He should hesitate to use jequirity in sthenic cases; it was the asthenic cases requiring stimulation that were suitable for this treatment.

Dr. D. S. Reynolds, of Louisville, Ky., read the next paper on the

Necessity for Reform in the Manner of Designating Lenses.

He said that often the difficulty was more in the defective apparatus than in the methods employed. The method which he employed was to abandon the idea of measuring and denoting lenses by their focal distance, and make the radius of

curvature the measure of the lens, having them measured from a unit of ninety degrees, or the quadrant of a circle. The lenses might be graded at intervals of five or ten minutes, and in the higher grades have an interval of fifteen minutes. He gave a description of an instrument of Professor Snellen's for determining the value of a lens. It consists of a stand, on which a horizontal beam carries at one end a lamp, and near it a positive lens of one-sixth. In the centre of the beam is placed a clamp for holding the lens to be tested. On each side of the centre, on the beam, is placed a lens plano-convex one-twelfth. Near the lamp is placed a copper disk, perforated by two lines of minute holes, one line perpendicular and the other horizontal. At the farther end of the beam, working in a graduated brass plate, is a frosted glass disk. Steel tapes pass up through the stand and along the beam, connecting with the frosted disk and the perforated plate. It is easy by this means to note the exact point where the point of light reaches the frosted disk without any red or colored margin, and by revolving the lens on trial in the clamp, any irregularity can be easily ascertained.

Dr. Landolt, of Paris, wished to know how the essayist would express in writing the power of the glass by his proposed method. In reply, Dr. Reynolds wrote the prescription for a supposed case on the black-board:

O. D.		O. S.	Bis C.
$+{}^{1}/_{20}$ c. 90°	⊂ $+{}^{1}/_{40}$ s.	$+{}^{1}/_{60}$ c. 75°	⊂ $+{}^{1}/_{60}$ s.	$2{}^{1}/_{2}{}^{11}$

Mr. J. Richardson Cross, of Bristol, Eng., wanted to know the focal length of the unit of Dr. Reynolds' system, and received the reply that it would be something less than an inch.

Dr. Landolt suggested that the radius of curvature, while most accurate as a unit of measurement, is not satisfactory, as with the same radius there may be differencesin composition and differences in the refractive power. The manufacturers' lenses will tell you that the refracting index of lenses is a variable quantity, and no one can make lenses, even of the same mate-

rial, that will always have an exactly similar refracting index.

Dr. Burnett, of Washington, D. C., thought we could not get along without a knowledge of the focal distance of the lens. His objections to the proposed change were that Dr. Reynolds' plan lacks simplicity, and that the present method seems to answer the purpose very well and is universally adopted; and that the change would be very difficult to make.

Mr. Cross thought that the proposed plan was based on scientific accuracy. But, as a reformer, the author must not expect to succeed until he can give us a medium which is as accurate as his quadrant. The speaker himself was perfectly content with the accuracy of the metre. Of course it is not quite accurate, but much more so than any other measurement we have. Then all refraction deals with focal length. Our patients want to see at a certain distance. We fit them with glasses to see to a particular point. Again, contrast the simplicity of the metre with the complicated formula of Dr. Reynolds. It is as bad as going back to the inch-system.

Dr. Allen, of Pittsburg, Pa., was unwilling to return to the old system of numerals in refraction. We deal constantly with distance, and distance is measured on a straight line. He thought the adoption of the method would be a step backward.

Dr. Thompson, of Indianapolis, Ind., thought we could not always make scientific methods practicable. He was well enough satisfied to write in the metric system. There was no certainty in the composition of spectacle lenses, even in pebbles, of which so much was talked about all over the country, and so few sold.

Dr. E. Jackson, of Philadelphia, Pa., then read a paper on

The Designation of Prisms by the Minimum Deviation instead of by the Refraction-Angle.

The object of the paper was to urge the advisability of extending the same principle to the numbering of prisms that now obtains in relation to lenses. The refracting power of the

prism depends upon the substance of which it is composed, and upon the medium in which it is placed. The latter being air, can be eliminated in practice. The same difference existing in the material of which prisms are made as in that of spherical and other lenses, it follows that prisms cut to the same angle may differ very much in the extent to which the ray is bent in passing through them. For instance, a prism marked 3° may have a refracting power of 1.51° or 2¼°, and yet be the correct one according to the prescription, by our present method of measurement. Among a number of prisms tested only one set came within sixteen per cent. of the supposed standard. He proposed to take as the basis of measurement the minimum deviation or the deflection of the ray when it passed through parallel in the prism to the base, or where the angles made with the surface on entering and leaving were the same. The change could be easily made without producing confusion with the present system by marking the number of the new system inside a circle.

Dr. Landolt, of Paris, expressed himself as much interested in the paper. It was exceedingly meritorious, logical and practical, and he would regard it as an honor to carry out the proposal to support the idea. He moved that the Section take up and support the opinion expressed in the paper.

Dr. Reynolds seconded the motion.

Mr. Power, of London, England, moved that a committee be appointed by the Chair to take charge of the subject, and to report at the next Congress. Carried unanimously.

Dr. G. S. Norton, of New York, read a paper on the

Relative Importance of Small Degrees of Astigmatism as a Cause of Headache and Asthenopia.

He related a number of cases which had occurred to him, where correction of astigmatism of only 0.25 D caused relief to follow with remarkable rapidity. His conclusion was that 0.25 D. of astigmatism may, and not unfrequently does, produce disturbance which its correction relieves. It most com-

monly occurs in children and young girls that small degrees occasion disturbance and asthenopia. If the hyperopia is of high degree, it is better to try to correct the trouble with spherical glasses first.

Dr. F. B. Tiffany, of Kansas City, Mo., next read a paper, under the title of

AMETROPIA,

introducing a series of statistical tables based on examination of over two thousand school-children in Kansas City, including three races—white, red and black. The object of each examination was to ascertain the condition of the eyes, nature of the affection, and endeavor, if possible, to remedy it. The examination took in hypermetropia, astigmatism, and spasm of accommodation, as well as myopia.

The matters of light and ventilation were so well arranged that they might be eliminated as factors in the result. It appeared as if the greater number of ametropes in proportion were in the higher classes, and it might be said that ametropes were more fond of study than emmetropes. Spasm of accommodation developed into myopia. If the eyes were examined each year and corrected carefully, the anomalies would gradually diminish. Hazel eyes are most affected by myopia; blue and gray stronger than hazel, brown and black. Females have more myopia than males, and Indians are mostly emmetropic.

Dr. Burnett, of Washington, D. C., remarked that he suspected that in the prompt relief spoken of by Dr. Norton the astigmatism was between 0.25 D. and 0.5 D. He found that when one of these cases did so well with 0.25 D., the total amount was somewhat greater.

Dr. Herbert, of Philadelphia, has been astonished to find how little annoyance is felt in high degrees of ametropia and astigmatism, and how much from slight degrees. He had had not infrequently to prescribe as low as 0.2 D.

Dr. Tilley, of Chicago, remarked on Dr. Tiffany's paper that every new born child is hypermetropic. Myopia does not generally occur till six or seven years of age.

Dr. Young, of Iowa, remarked that the astigmatic glass determined under atropia was not always accepted. The ciliary muscle did not always readily change its compensatory contraction, and a cure by cylinders was sometimes worse than the disease.

Dr. Dickinson, of New York, related a case of reflex irritation, with nausea, etc., existing three years, which had been promptly relieved by correction of a very low-power cylinder.

Dr. Baldwin, of Montgomery, Ala. wished to state, as to the condition of the negro in regard to refractive troubles, that in over nine hundred cases he had only found an error of refraction in about eight per cent. This seems to bear out the old doctrine that civilization increases eye troubles.

Dr. Calhoun, of Atlanta, Ga., stated that it had been his experience that the negro had very little refractive trouble, and, if they have not been to school, none whatever. He had known of but one near-sighted negro up to ten or fifteen years ago. Now myopia is becoming more frequent. They are subject to other eye troubles, specific affections of the cornea and other parts, but they do not seem to be so serious as in the white, and get well very easily, with almost no treatment at all. Another thing, glaucoma is of extremely uncommon occurrence among them. He had only seen three cases among negroes.

Dr. Burnett, of Washington, D., could corroborate what Drs. Baldwin and Calhoun had said concerning the increase of myopia in the negro of late years, and desired also to call attention to the fact that the negro does not squint. He thought that glaucoma occurred in the negro, although, perhaps, not to the same extent.

Dr. Blitz, of Minneapolis, Minn., wished to add his testimony to what had already been said about refractive errors and squint in the negro. He finds disease more easily handled in the negro than in the white.

Dr. Galezowski, of Paris, said that in many cases asthenopia was caused by small degrees of astigmatism, but in many others this had not the effect. He instanced the case of a student, an American, who suffered great inconvenience when

using his eyes. Professor Hirschberg, of Berlin, found a slight degree of astigmatism, and corrected it, which relieved the patient for two weeks, and then he became worse again. He came to Paris, and under Dr. Galezowski's notice, who suspected that it was not the ametropia that was causing the trouble. Examination disclosed tenderness over the supra-orbital notch, over the right eye, and all around the left eye. He suspected trouble with the teeth, and found one that had been plugged, but was not tender. He had the plug taken out, and found a small piece of rubber crowded up through the top of the tooth. The tooth was extracted, and the patient recovered. These cases are not infrequent. In other cases it may be a slight alteration in the lachrymal punctum. To test the matter, Dr. Galezowski injects tepid water, and if it enters the nose badly, it is treated by daily injections and dilatation of the canal, not catheterization.

Dr. Reynolds, of Louisville, Ky., remarked upon the difficulty of having the patient wear glasses properly, especially in people who were not in the habit of wearing them. In some cases the distance between the eyes has to be so nicely adjusted that the patient must have a pair for distance a little wider apart, and a pair for near work closer together.

Dr. Gradle, of Chicago, found very few of his cases of asthenopia relieved by weak cylinders.

Dr. Leartus Connor, of Detroit, Mich., does not recollect that he has had occasion to use as little as 0.25 D.

The president referred to his own experience as corroborating the remarks of the previous speakers in relation to errors of refraction in the negro.

Dr. E. Smith, of Detroit, Mich., found a great amount of refractive error among negroes, and said that it was not uncommon for him to operate upon them for strabismus. It may not be so in the pure negro. In his section they are considerably mixed.

Dr. Erwin, of Ohio, stated that as oculist to the Pennsylvania Railroad Company, he had found that about twenty-five per cent of the men employed in the transportation service are

astigmatic, and yet not more than twenty per cent of those referred for special examination have astigmatism. None of the twenty per cent complained of vision, except referred for spectacles, and only ten per cent of those so referred required correction of astigmatism to relieve suffering.

Dr. Norton, in closing the discussion, said that he had not advanced the subject as anything new. He agreed with Professor Galezowski that many other causes might produce asthenopia and neuralgic symptoms. As to the exact determination of the amount of astigmatism, he used two sets of radiating lines, one coarser than the other, and when the patient was able to see all the lines in the finer diagram he was quite sure to be accurately corrected.

In rising to adjourn the Section the president, in a few well-chosen words, thanked the members for bearing with him and so cordially supporting his endeavors, and expressed the hope that it had been a season of pleasure and profit to all. There was no doubt about its having been a success.

Mr. Power, of London, England, moved a vote of thanks to the president for his agreeable way of conducting the meetings, and thanked the Section and the profession for the very pleasant time enjoyed.

Dr. Landolt, of Paris, France, wished to warmly support Mr. Power's motion. To the good help of their American brethren, as well as the untiring energy of the president, the success of the meeting was due.

Dr. Galezowski, of Paris, France, also expressed his pleasure and thanks in a few well-chosen words. The Section then adjourned *sine die*.

After adjournment Mr. J. Richardson Cross, of Bristol, England, gave a demonstration of the method of

RETINOSCOPY,

as used by him with Doyne's optometer.

CORRESPONDENCE.

"PATHOGENESIS OF PTERYGIUM."

EDITOR.—In Dr. Theobald's suggestion regarding the pathogenesis of pterygium published in the August number of your journal, I have to confess to a feeling of disappointment. To my mind it is much easier to account for the origin of the growth and its common location over the internal recti muscles, than to account for the peculiarities of the growth when once established—its trowel-like shape, overlapping edges, and disposition to march regularly to the centre of the cornea.

That there is sufficient justification for the teaching that "development of pterygium is favored by conditions which produce persistent hyperæmia of the conjunctiva" is manifested in the fact that it is most commonly found in sea-faring people, stokers, founders and farmers, particularly those on the high prairies of the West and Northwest. In their everyday work these people (the farmers more perhaps than any other class, and with them it is most common) experience "persistent hyperæmia of the conjunctiva" from the forcible and continued impact of such irritants as strong winds, glaring light, scorching heat and clouds of dust. Their work is varied, too, in character, but the exposure is practically the same and the results are identical. It would be strange, indeed, if the surroundings were not intimately connected with the result, and I believe that the further the matter is investigated, the more conclusive will it be, that there is a most intimate connection—in short that the continued exposure to irritant winds, heat and dust is the principal causation of pterygium.

As to the location of the growth, there is good reason in this view why it should be found so uniformly over the internal

recti muscles. To shut an eye to irritants and yet keep it open sufficiently to see any work ahead the orbicularis necessarily contracts irregularly. Extremely to the temporal side, moderately through the rest of its course. The result is that in the great majority of people the eye is well protected except over the centre of the cornea and a small strip to the nasal side of the cornea. If it is attempted to cover this strip it will usually be found that the cornea has also been covered sufficiently to materially interfere with the use of the eye. With a mirror anyone can demonstrate this for himself. In short, again, if exposure produces the growth what more natural than that it should be on the part most exposed? And this is directly over the internal recti muscles.

That pterygium is occasionally due to other causes I have no doubt. It has been demonstrated that it can come from a marginal ulcer. But if want of harmony between convergence and accommodation is of itself a potent factor in the causation, it should be prevalent among book-keepers, students and house-workers generally. These people, however, seem to have a wonderful immunity from it. While on the other hand, the people who live out of doors and have the minimum exercise of convergence and accommodation are its victims.

H. B. YOUNG, M.D

Burlington, Iowa.

GLEDITSCHINE.

The following letter was received and we publish it here for the benefit of our readers. Although we withhold the name of our correspondent, their testimony is absolutely reliable. It explains itself.

DEAR SIR :—We are in receipt of your valued favor of the 25th inst. and in reply would say that our investigation of "gleditschia triacanthos" has proved it to be worthless, and such being the case, we do not think it worthy of your attention.

When the alkaloid was spoken of some time ago by physicians we immediately procured a 2 per cent. solution of it for investigations, being unable to obtain the alkaloid itself, and analysis of it by our chemists proved it to contain 6 per cent. of cocaine with a trace of what we are led to believe is atropine, thus showing conclusively that the alkaloid (?) itself is a humbug. Upon the report of certain physicians we made tests of the alkaloid, and finding it to possess anæsthetic properties we were induced to prepare the fluid extract which was spoken of in the medical journals. The alleged alkaloid, however, proving worthless, of course, the fluid extract would not possess any great medicinal properties.

We are always on the alert, either to introduce to the medical profession valuable new therapeutic agents, or to expose such humbugs as these when they are palmed off on them by unscrupulous persons.

Awaiting the pleasure of your further commands when we can serve you, and assuring you of our desire to do so, we remain, very truly your friends.